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DIVISION OF MINES AND GEOLOGY
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February 23, 1998

Mr. David J. Cole
City Manager
City of Morro Bay
595 Harbor Street
Morro Bay, California 93442

RE: PANAY AND NEVIS STREET LANDSLIDES, MORRO BAY
SAN LUIS OBISPO COUNTY, CALIFORNIA

Dear Mr. Cole:

This letter was prepared in response to a request made on February 12, 1998, from the Governor's Office of Emergency Services (OES) - Southern Region (Ann Tanouye) for technical (geological) assistance from the Department of Conservation, Division of Mines and Geology (DOC/DMG) for the City of Morro Bay, as requested by the San Luis Obispo County OES, in evaluating the reactivation of landslides that were previously investigated Pamela Irvine in 1995 (Irvine, 1995). I have received information from Irvine concerning her 1995 investigation of the Morro Bay landslide and have discussed the local conditions with her. The State OES Mission Number for the 1998 evaluation is No. 98-SOU6106.

INVESTIGATION

On February 18, 1998 I visited the office of the Morro Bay Fire Chief, Jeff Jones, who is also the City's Emergency Services Coordinator and Clyde Ganes, building inspector, to discuss the landslide situation and the feasibility of mitigation. Clyde Ganes guided me during the site inspection (see attached map). Evidences of surficial ground movement have been observed but no structural damage to the houses was noticed. The nearby 30-inch Whale Rock Reservoir water pipeline which has a history of leakage, has been drained and some dewatering activities have been conducted at the upper part of the landslide.

GEOLOGY AND SLOPE HAZARDS

The areas of concern are the Panay Street landslide, which is a slump and earthflow complex, and the shallow Nevis Street landslide area, which is adjacent to the south (see map attached). Both areas are located at the north end of the City of Morro Bay. Approximately 25 houses are built on the toe portion of the Panay Street landslide deposit; about five houses were reported to be

damaged by the 1983 rains. Fifteen residences at Panorama Street are located adjacent to (downslope of) the toe of the surficial Nevis Street landslide area. The 30-inch diameter underground water pipeline of the Whale Rock Reservoir crosses both landslides in the vicinity of the houses. The pipeline ruptured on March 17, 1995, and is suspected to have a history of frequent leakages. The undeveloped upper parts of both landslide areas are owned by Chevron and are under the jurisdiction of San Luis Obispo County. Chevron has installed some inclinometers and dewatering devices in the landslide areas, and they have surveyed the area. The complete results of Chevron's mitigation and investigation were not made available to us.

The slopes of the two landslide areas are underlain by the slide prone Franciscian melange (Jurassic and Cretaceous, sheared graywacke, with conglomerate, schist, greenstone, chert, serpentinite, shale, etc.). The upper portion of the Panay Street landslide is underlain by a branch of the Late Quaternary Cambria Fault. Many debris flow scars are present on the slopes.

CONCLUSION

1) No immediate risk or emergency was evident in the Panay Street and Nevis Street landslide areas in the City of Morro Bay. However, potential debris flow and earthflow (mudflow) activity could impact the road and some residences along Panorama Street during intense rainstorms of long duration.

2) Feasible mitigation options for the Panay Street landslide area include reduction of urban irrigation; installation of dewatering devices (waterwells, lateral subdrainage, etc.); continuing requirement of proper deep foundations (caisson, piles, etc.) for buildings; replacing the City's buried water utility lines and the 30-inch water pipeline with above-ground pipes; placement of shear pins along streets; and sealing ground fissures and ground surfaces during rainfalls.

3) Assistance from a Certified Engineering Geologist is advisable to conduct further investigation of existing reports/data to determine more precisely the nature and severity of the unstable slope conditions such as: examination of topographic surveying records performed by Chevron and the Whale Rock Reservoir pipeline commission; study of the results of investigation and mitigation activity performed by Chevron and their consultants (Earth Systems Consultants, etc.); and search for more information concerning the 1983 damage to residences in order to determine the contributing sources of damage (shallow or deep-seated ground movement, erosion, poor construction, expansive soil, differential settlement, poor man-made fill material, or combination of factors).

Main references:

Hall, C.A., and Prior, S.W., 1975, Geologic map of the Cayucos-San Luis Obispo region, San Luis Obispo County, California: U.S. Geological Survey, Map MF-686, scale 1:24,000.

Irvine, P.J., 1995, Response to OES request for landslide hazard assessment-Morro Bay and Cambria, San Luis Obispo County: California Division of Mines and Geology, unpublished memorandum.

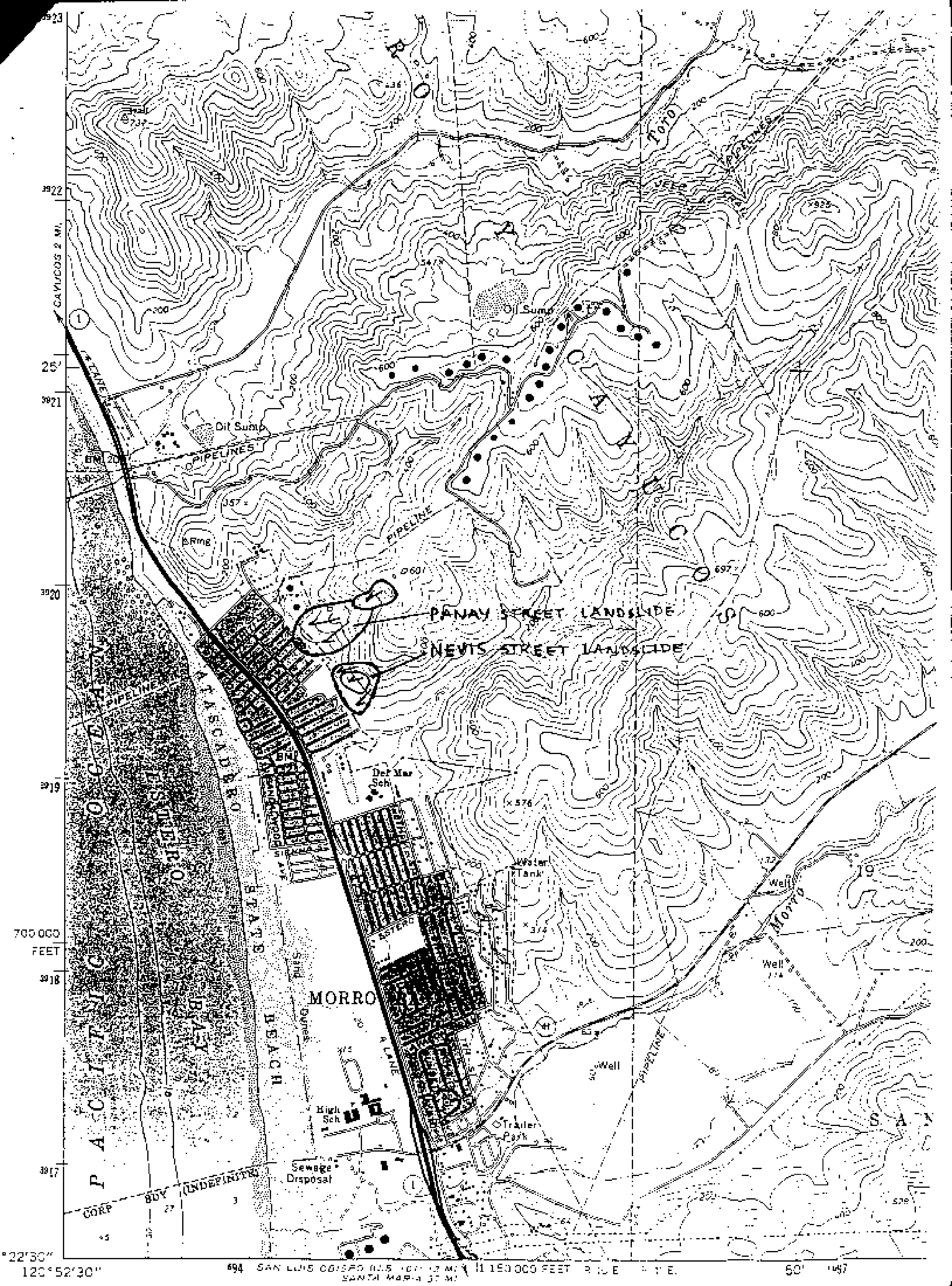
Siang S. Tan, CEG 975
Associate Engineering Geologist

Concur

Date Trinda L. Bedrossian, CEG 1064
Supervising Geologist

Attachment: Location map

cc: Jeff Jones
Ann Tanouye
James Davis


PANAY STREET LANDSLIDE
NEVIS STREET LANDSLIDE
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Oil Sump
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PIPELINE
PIPELINE
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High Sch
Del Mar Sch
Water Tank
Trailer Park
Sewage Disposal
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